FREQUENCY OF CROSS-LINKS AND MOLECULAR WEIGHT DISTRIBUTIONS IN COALS. Jeffrey Kovac and John W. Larsen, University of Tennessee, Chemistry Department, Knoxville, Tennessee 37916

Coals may be mixtures of cross-linked macromolecules. Information on the average molecular weight of the chain segment between cross-links can be obtained from equilibrium solvent swelling measurements using the Flory-Rehner equation as well as from the plastic deformation properties of coals using the Gaussian model for the elastic modulus of polymer networks. Attempts to develop a simple non-Gaussian theory of a polymer network which should be a more reasonable model for coal will be described. The average molecular weight per cross-link calculated using the above techniques will be compared with data obtained from solubilized and depolymerized coals. The implications for various coal structure models will be discussed.